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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,637	10/24/2003	Satoshi Tokuda	SUT-0229	7634
23353 7590 03/27/2007 RADER FISHMAN & GRAUER PLLC LION BUILDING 1233 20TH STREET N.W., SUITE 501 WASHINGTON, DC 20036			EXAMINER BAKER, DAVID S	
			ART UNIT	PAPER NUMBER
			2884	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/27/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/691,637	<b>Applicant(s)</b> TOKUDA ET AL.	
	<b>Examiner</b> David S. Baker	<b>Art Unit</b> 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 20-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20, 23 and 24 is/are allowed.
- 6) ☒ Claim(s) 21-22, 25-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Amendment***

1. The amendment filed on 20 February 2007 has been accepted and entered.

***Claim Objections***

2. Claims 21-22, 25-34, and 38-39 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Regarding claims 21-22, the claims fail to further limit the parent claim. The base claim provides for a method of producing a radiation detector; claims 21-22 are directed toward the radiation detector made by the method. To be entitled to patentable weight in method claims, the recited structural limitations therein must affect the method in a manipulative sense and not amount to mere claiming of a use of a particular structure. The structural limitations found in claims 21-22 do not further limit the method of manufacture in any way.

Regarding claims 25-34, the claims fail to further limit the parent claim. To be entitled to patentable weight in method claims, the recited structural limitations therein must affect the method in a manipulative sense and not amount to mere claiming of a particular structure. The structural limitations found in claims 25-32 do not further limit the method of manufacture in any manipulative way.

Regarding claims 38-39, the claims fail to further limit the parent claim. To be entitled to patentable weight in method claims, the recited structural limitations therein

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must affect the method in a manipulative sense and not amount to mere claiming of a particular structure. The structural limitations found in claims 38-39 do not further limit the method of manufacture in any manipulative way.

3. Claims 21-22, 33-34, and 38-39 are objected to under 37 CFR 1.75(c) as being in improper form because they fail the infringement test. See MPEP § 608.01(n) III:

#### INFRINGEMENT TEST -

The test as to whether a claim is a proper dependent claim is that it shall include every limitation of the claim from which it depends (35 U.S.C. 112, fourth paragraph) or in other words that it shall not conceivably be infringed by anything which would not also infringe the basic claim.

A dependent claim does not lack compliance with 35 U.S.C. 112, fourth paragraph, simply because there is a question as to (1) the significance of the further limitation added by the dependent claim, or (2) whether the further limitation in fact changes the scope of the dependent claim from that of the claim from which it depends. The test for a proper dependent claim under the fourth paragraph of 35 U.S.C. 112 is whether the dependent claim includes every limitation of the claim from which it depends. The test is not one of whether the claims differ in scope.

Thus, for example, if claim 1 recites the combination of elements A, B, C, and D, a claim reciting the structure of claim 1 in which D was omitted or replaced by E would not be a proper dependent claim, even though it placed further limitations on the remaining elements or added still other elements.

Examiners are reminded that a dependent claim is directed to a combination including everything recited in the base claim and what is recited in the dependent claim. It is this combination that must be compared with the prior art, exactly as if it were presented as one independent claim.

The fact that a dependent claim which is otherwise proper might relate to a separate invention which would require a separate search or be separately classified from the claim on which it depends would not render it an improper dependent claim, although it might result in a requirement for restriction.

The fact that the independent and dependent claims are in different statutory classes does not, in itself, render the latter improper. Thus, if claim 1 recites a specific product, a claim for the method of making the product of claim 1 in a particular manner would be a proper dependent claim since it could not be infringed without infringing claim 1. Similarly, if claim 1 recites a method of making a product, a claim for a product made by the method of claim 1 could be a proper dependent claim. On the other hand, if claim 1 recites a method of making a specified product, a claim to the product set forth in claim 1 would not be a proper dependent claim since it is conceivable that the product claim can be infringed without infringing the base method claim if the product can be made by a method other than that recited in the base method claim.

#### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 21, 33, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Agouridis (US 4,243,885 A).

Regarding claims 21, 33, and 38, Agouridis discloses a radiation detector comprising: a detection layer formed of a polycrystalline film comprising CdTe that is doped with Cl (C:2 L:19-32).

6. Claims 35-37 are rejected under 35 U.S.C. 102(b) as being anticipated by McCandless (US 6,251,701 B1).

Regarding claim 35, McCandless discloses a method of producing a radiation detector comprising: placing a supporting substrate into a deposition chamber (C:3 L:45 thru C:5 L:18); forming a polycrystalline CdTe detection layer on the substrate (C:3 L:45 thru C:5 L:18); introducing a Cl gas to the deposition chamber (C:3 L:45 thru C:5 L:18); and performing a heat treatment on the detection layer in order to dope the detection layer with Cl (C:3 L:45 thru C:5 L:18).

Regarding claims 36 and 37, McCandless discloses that the heat treatment is carried out under atmosphere containing H<sub>2</sub> kept at  $1.3 \times 10^{-3}$  to 1 atmospheric pressure (C:3 L:45 thru C:4 L:54).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 22, 34, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agouridis (US 4,243,885 A) in view of Schiebel (US 5,396,072 A).

Regarding claims 22, 34 and 39, Agouridis discloses all the claimed limitations except a plurality of charge accumulation capacitors for accumulating charges from the detection layer and a switching matrix substrate including switching devices arranged in an array, wherein the switching devices read out charges of the plurality of charge accumulation capacitors. Schiebel discloses a plurality of charge accumulation capacitors (F:1) for accumulating charges (C:5 L:67 thru C:6 L:38) from the detection layer (F:3b) and a switching matrix substrate including switching devices (F:1) arranged in an array (F:1), wherein the switching devices read out charges of the plurality of charge accumulation capacitors (C:5 L:67 thru C:6 L:38). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include a plurality of charge accumulation capacitors for accumulating charges from the detection layer and a switching matrix substrate including switching devices arranged in an array, wherein the switching devices read out charges of the plurality of charge accumulation

capacitors. The motivation for doing so would allow for a two dimensional representation of the radiation impingement due to the nature of the array resulting in an improved image of the radiation pattern.

10. Claims 25-32 rejected under 35 U.S.C. 103(a) as being unpatentable over Agouridis (US 4,243,885 A) in view of Tokuda (JP 2001-242255 A).

Regarding claim 25, Agouridis discloses all the claimed limitations except a common electrode being between the substrate and a hole injection preventing layer, and the detection layer being between the hole injection preventing layer and the common electrode. Tokuda discloses a CdTe detector comprising: a common electrode being between the substrate and a hole injection preventing layer (D:2), and the detection layer being between the hole injection preventing layer and the common electrode (D:2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the structure of Tokuda in the detector of Agouridis. The motivation for doing so would have been to improve the signal to noise ratio as well as improve the performance of the hetero-junction.

Regarding claim 26, Tokuda discloses that the hole injection preventing layer is a CdS film (P:0034).

Regarding claim 27, Tokuda discloses that the electron injection preventing layer is between the detection layer and a detection electrode (D:2).

Regarding claim 28, Tokuda discloses that the electron injection preventing layer may be a  $\text{Sb}_2\text{Te}_3$  film (P:0034).

Regarding claim 29, Agouridis discloses all the claimed limitations except a common electrode being between the substrate and an electron injection preventing layer, and the detection layer being between the electron injection preventing layer and the common electrode. Tokuda discloses a CdTe detector comprising: a common electrode being between the substrate and an electron injection preventing layer (D:2), and the detection layer being between the electron injection preventing layer and the common electrode (D:2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the structure of Tokuda in the detector of Agouridis. The motivation for doing so would have been to improve the signal to noise ratio as well as improve the performance of the hetero-junction.

Regarding claim 30, Tokuda discloses that the electron injection preventing layer may be a  $\text{Sb}_2\text{Te}_3$  film (P:0034).

Regarding claim 31, Tokuda discloses that the hole injection preventing layer is between the detection layer and a detection electrode (D:2).

Regarding claim 32, Tokuda discloses that the hole injection preventing layer is a CdS film (P:0034).

*Allowable Subject Matter*

11. Claims 20 and 23-24 allowed.
12. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 20, the prior art of record does not disclose or reasonably suggest, along with the other claimed limitations, a method for producing a radiation detector comprising: namely, using as a vapor deposition source a mixture of a first



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material including at least one of CdTe, ZnTe, and CdZnTe and a second material including at least one of CdCl<sub>2</sub> or ZnCl<sub>2</sub>.

Regarding claim 23, the prior art of record does not disclose or reasonably suggest, along with the other claimed limitations, a method for producing a radiation detector comprising: namely, using as a sublimation source a mixture of a first material including at least one of CdTe, ZnTe, and CdZnTe and a second material including at least one of CdCl<sub>2</sub> or ZnCl<sub>2</sub>.

Regarding claim 24, the balance of claims is found allowable due to their dependence upon an already allowed claim and lacking any technical errors.

#### *Response to Arguments*

13. Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the cancellation of the claims and in view of the new ground(s) of rejection.

#### *Conclusion*

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,398,624 B1 – Izumi discloses a Cl aqueous doping method that teaches away from vapor deposition or sublimation.

US 6,512,233 B1 – Sato discloses all of the claimed limitations except for doping with Cl.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Baker whose telephone number is (571) 272-6003. The examiner can normally be reached on MTWRF 9:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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